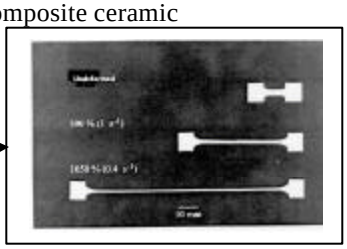
ARO-FE Executive Bulletin

Aug 15 - Nov 15, 2001

DISUMS

Since November 1999, forty-five (45) DISUMS have been submitted to ARO. All of them are recorded in the ARO-FE Quarterly Reports. Here is one of the latest DISUMS:

A high –strain-rate superplastic ceramic - ARO-FE visits Dr. K. Hiraga of the *National Institute for Materials Science, Tsukuba, Jp.* High-strain-rate superplasticity has been observed in Al & Mg based alloys. For ceramics, superplastic deformation has been restricted to low strain rates of the order of 10^{-5} to $10^{-4}s^{-1}$ for most oxides and nitrides with the presence of intergranular cavities leading to premature failure. The team led by Dr Hiraga, has shown that a composite ceramic material consisting of tetragonal zirconium oxide, magnesium aluminate spinel and alpha-alumina phase exhibits superplasticity of strain rates up to $1s^{-1}$. The composite also exhibits a large tensile elongation, exceeding 1,050 per cent for a strain rate of $0.4s^{-1}$. It is suggested that the present results hold promise for the application of shape-forming technologies to ceramic materials. Figure shows specimens before & after deformation at 1650^0C. At $0.4s^{-1}$ tensile test was terminated before failure owing to a limitation of the loading span available in the testing machine. See also **www.nature.com**



ABSTRACTS

Here are the latest Abstracts of Conferences co-sponsored by ARO-FE. Please click ***Blue Titles*** for details.

- **The International CW Demil Conference**
- **IPRM2001**
  Indium Phosphide and Related Materials

- **Advanced Research Workshop on Semiconductor Nanostructures**
- **THERMEC 2000**
  Processing & Manufacturing of Advanced Materials Processing, Fabrication, Properties, Applications

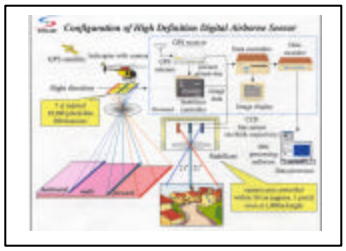
"SEED" PROJECTS

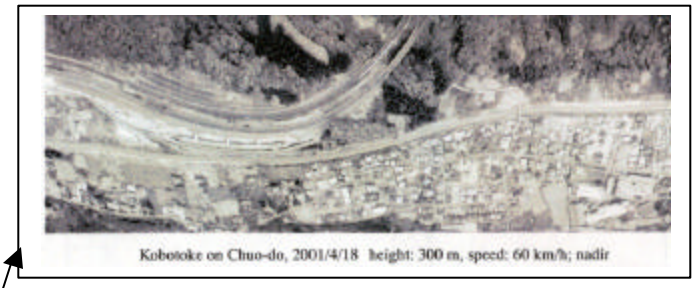
ARO-FE is presently supporting six (6) "Seed" Projects. See chart for details →

"ARO-FE SEED PROJECTS.ppt"

MOST INTERESTING SITE VISIT

Col Rick Ryles (US Army STAN Group); Dr. Giuliano D'Andrea (US Army R&D Field Office); Lt. Col. Bill Kaneshiro (AMEMB Tokyo, MDAO); Dr. Ted Sumrall (AOARD); Dr. Mostafa Talukder (ONR-IFO); Mr. Al Trawinski (AMC-FCT); and Mr. Mike Avanzado (US Navy-FCT) visited Starlabo Corp. in Tokyo, Japan. Starlabo presented their High-definition Digital Airborne Sensor, which consists of : a. Helicopter mounted camera system capable of scanning a large target area with 3 sets of CCD line sensors (including sensors for R, G and B light) in the forward, nadir and rear direction; b. High-definition stabilizer (which cancels camera tremor detected via high-performance gyroscope); c. High-performance 3D GPS system (which records in real-time the 3D position of the helicopter, etc.), and d. Data acquisition/storage system (which fits acquired data - normally distorted in other systems). Three CCD lines (approx. 10,200 elements each) are collected directly into the focal plane of a single camera. Image resolution is 3cm at an altitude of 300m. Advantages are: Continuous imaging (with a fixed eye point in the direction of flight); Digital color images with cm. level resolution; High-definition 3D measurement data; Short to real time image generation; Limited set-up requirements for ground control points; Simultaneous speed measurement for multiple moving objects, and Ability to measure building/wall surfaces with a slanted camera axis. The visit was organized by Lt. Col. Bill Kaneshiro (AMEMB Tokyo, MDAO).





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